

IN THE CLAIMS:

Please cancel claims 1-5 without prejudice to including such or similar claims of a different scope in a subsequent continuation, divisional, or continuation-in-part patent application, and substitute therefore the following new claims 6-226:

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6. A method for producing a desired hard tissue in a body of a human patient comprising placing a growth factor in said body to form a bud which grows into said desired hard tissue.
 7. The method of claim 6, wherein said hard tissue comprises a tooth.
 8. The method of claim 6, wherein said hard tissue comprises a bone.
 9. A method for producing a desired hard tissue in a body of a human patient comprising producing a bud with use of a growth factor and then placing said bud into said body so that said bud grows into said desired hard tissue.
 10. The method of claim 9, wherein said growth factor comprises genetically produced living material.
 11. The method of claim 9, further comprising placing a growth factor proximate to said bud after said bud is placed in said body.
 12. The method of claim 9, wherein said hard tissue comprises a tooth.

13. The method of claim 9, wherein said hard tissue comprises bone.
14. The method of claim 13, wherein said bone is a complete bone.
15. A method for producing a desired soft tissue in a body of a human patient comprising placing a growth factor in said body to form a bud which grows into said desired soft tissue.
16. The method of claim 15, wherein said soft tissue comprises mesodermal tissue.
17. The method of claim 15, wherein said soft tissue comprises ectodermal tissue.
18. A method for producing a desired soft tissue in the body of a human patient comprising producing a bud with use of growth factor and then placing said bud into said body so that said bud grows into said desired soft tissue.
19. The method of claim 18, wherein said growth factor comprises genetically produced living material.
20. The method of claim 18, further comprising placing a growth factor proximate to said bud after said bud is placed into said body.
21. The method of claim 18, wherein said soft tissue comprises mesodermal tissue.

22. The method of claim 18, wherein said soft tissue comprises ectodermal tissue.
23. A method of producing a human bud comprising producing a bud with use of a growth factor outside the body of a human.
24. The method of claim 23, wherein said growth factor comprises genetically produced living material.
25. The method of claim 23, wherein said growth factor comprises a tooth bud.
26. The method of claim 23, wherein said growth factor comprises a bone bud.
27. The method of claim 24, wherein said growth factor comprises a tooth bud.
28. The method of claim 24, wherein said growth factor comprises a bone bud.
29. A method of reviving a dead portion of a pre-existing organ comprising placing a growth factor at a selected area of a patient to form an artery thereby causing said dead portion of said organ to be revived.
30. The method of claim 29, wherein said organ comprises a brain.
31. The method of claim 29 further comprising inserting a gene at said selected area to stop

further artery formation.

32. The method of claim 29 further comprising inserting a growth factor at said selected area to stop further artery formation.
33. The method of claim 29 further comprising inserting an extracellular matrix to stop further artery formation.
34. The method of claim 31 further comprising controlling said gene with use of a genetic switch.
35. The method of claim 31, wherein said organ comprises a heart.
36. A method of replacing a dead portion of a pre-existing organ in a body of a patient comprising placing a muscle growing agent selected from the group consisting of cells, genes, and cells and genes adjacent to said dead portion to grow new muscle and placing genetic material adjacent to said dead portion to grow new arteries thereby growing a new portion of said organ; and then replacing said dead portion with said new portion.
37. The method of claim 36, wherein said dead portion is replaced by removing said dead organ portion and replacing it with said new portion.
38. The method of claim 36, wherein said dead portion is replaced by integrating said new portion into said dead portion.

39. The method of claim 36, wherein said organ comprises a heart.
40. The method of claim 36, wherein said muscle growing agent comprises a cell.
41. The method of claim 36, wherein said muscle growing agent comprises a gene.
42. The method of claim 36, wherein said muscle growing agent comprises a cell and a gene.
43. The method of claim 36 further comprising inserting a gene at said selected area to stop further muscle growth.
44. The method of claim 36 further comprising inserting a growth factor at said selected area to stop further muscle growth.
45. The method of claim 36 further comprising inserting an extracellular matrix at said selected area to stop further muscle growth.
46. A live organ comprising a pre-existing portion and a formerly dead portion that has been revived.
47. The organ of claim 46, wherein said organ is a heart.
48. The organ of claim 46, wherein said organ is a brain.

49. A live organ comprising a pre-existing portion and a newly grown muscle portion that replaced a dead portion of said organ.
50. The organ of claim 49, wherein said organ is a heart.
51. A live organ comprising a pre-existing portion and a newly grown portion.
- 42 52. The live organ of claim 51, wherein said organ is a heart.
53. The live heart of claim 52, wherein said pre-existing and said new portions comprise a pump.
54. The method of claim 53, wherein said pump comprises a two-chambered pump.
55. A method of treating a burn wound in a patient comprising applying genetic material to a burned area to grow an organ and adjacent tissue.
56. The method of claim 55, wherein said genetic material comprises a growth factor.
57. The method of claim 55, wherein said genetic material comprises a gene.
58. The method of claim 55, further comprising controlling said genetic material with use of a genetic switch.

59. The method of claim 57, wherein said gene comprises muscle gene, fat gene, blood vessel gene, and skin gene.
60. The method of claim 59, wherein said genes comprise mesodermal genes.
61. The method of claim 59, wherein said genes are applied in the order specified above.
62. The method of claim 59, wherein said genes are applied simultaneously.
63. The method of claim 55, wherein said genetic material is sprayed onto said burned area.
64. A method of forming tissue comprising providing a cell and adding a growth factor to said cell to cause dedifferentiation of said cell into a germinal cell, redifferentiation of said germinal cell into a desired cell, and morphogenesis of said desired cell into tissue.
65. The method of claim 64, further comprising controlling a gene with use of a genetic switch.
66. The method of claim 64, wherein said tissue comprises an organ.
67. The method of claim 66, wherein said organ comprises a heart.
68. The method of claim 66, wherein said organ comprises an artery.

69. The method of claim 64, wherein said tissue comprises function specific tissue.
70. The method of claim 69, wherein said function specific tissue comprises pancreatic Islet cells.
71. The method of claim 64, wherein said cell is obtained from a patient.
72. The method of claim 71, wherein said cell is a skin cell of said patient.
73. The method of claim 64, wherein said cell is a universal donor cell.
- A2 74. The method of claim 64, wherein said growth factor is added to said cell in a cell nutrient culture.
75. The method of claim 64 further comprising replanting said tissue into the body of a patient at a stage of morphogenesis.
76. The method of claim 75, wherein said stage of morphogenesis is when morphogenesis is concluded.
77. The method of claim 64, wherein said germinal cell comprises a stem cell.
78. A method of forming tissue comprising providing a germinal cell and adding a growth

factor to said cell to cause direct differentiation and morphogenesis into tissue.

79. The method of claim 78, further comprising controlling a gene with use of a genetic switch.
80. The method of claim 78, wherein said germinal cell comprises a stem cell.
- #2 81. The method of claim 78, wherein said tissue comprises an organ.
82. The method of claim 78, wherein said tissue comprises function specific tissue.
83. The method of claim 78, wherein said tissue is formed in vivo.
84. The method of claim 78, wherein said tissue is formed ex vivo.
85. The method of claim 78, wherein said tissue is formed in vitro.
86. A method of forming a germinal cell comprising providing a cell and adding a growth factor to said cell to cause dedifferentiation of said cell into a germinal cell.
87. The method of claim 86, wherein said germinal cell comprises a stem cell.
88. The method of claim 86, further comprising adding cell nutrient culture with said growth factor.

89. The method of claim 86, further comprising adding physiological nutrient culture with said growth factor.
90. The method of claim 86, further comprising utilizing a carrier with said growth factor.
91. The method of claim 86, further comprising adding an enhancer with said growth factor.
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92. The method of claim 86, further comprising adding a promoter with said growth factor.
93. A method of treating a patient having diabetes comprising inserting a growth factor into an organ to create Islets of Langerhans whereby said patient's insulin production is increased.
94. The method of claim 93, wherein said growth factor comprises a gene.
95. The method of claim 93, wherein said organ comprises the pancreas.
96. The method of claim 93, wherein said organ comprises the kidney.
97. The method of claim 94, wherein said gene comprises Pax-6 initiator gene.
98. The method of claim 94, wherein said gene comprises Pax-4 initiator gene.

99. The method of claim 94, wherein said gene comprises ISL-1 initiator gene.
100. The method of claim 94, wherein said gene comprises NKXGA initiator gene.
101. The method of claim 94, further comprising controlling said gene with use of a genetic switch.
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102. A hybrid, multifunctional organ that has at least one more function than that of a naturally occurring organ.
103. The hybrid organ of claim 102 wherein said organ comprises a kidney containing Islets of Langerhans whereby said kidney is capable of producing insulin.
104. A method for correcting avascular necrosis in a body of a patient comprising inserting a genetic based material near a joint space to regrow an organ selected from the group consisting of a blood vessel, a bone, and a blood vessel and a bone.
105. The method of claim 104, wherein said organ comprises a blood vessel.
106. The method of claim 104, wherein said organ comprises a bone.
107. The method of claim 104, wherein said genetic based material comprises a gene.
108. The method of claim 107, wherein said gene comprises fibroblast growth factor gene.

109. The method of claim 107, wherein said gene comprises transforming growth factor gene.
110. The method of claim 107, wherein, said gene comprises VEGF gene.
111. The method of claim 107, wherein said gene comprises BMP gene.
112. The method of claim 107, wherein said genetic based material comprises a growth factor.
113. The method of claim 107, wherein said growth factor comprises VEGF growth factor produced by VEGF genes.
114. The method of claim 107, wherein said growth factor comprises BMP growth factor produced by BMP genes.
115. The method of claim 104 further comprising strengthening and supporting tissue near said joint space.
116. The method of claim 115, wherein said strengthening and supporting is accomplished with a fixation plate.
117. The method of claim 115, wherein said strengthening and supporting is accomplished with a screw.

118. A method of growing an organ in a body of a patient comprising inserting a genetic material and a physiological nutrient culture at a specific location of said body to induce the growth of an organ.
119. The method of claim 118, wherein said genetic material comprises a gene.
120. The method of claim 118, further comprising controlling said gene with use of a genetic switch.
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121. The method of claim 118, wherein said genetic material comprises a growth factor.
122. The method of claim 118 further comprising placing an extracellular matrix around said genetic material.
123. A method of growing a suborgan in a body of a patient comprising inserting a genetic material and a physiological nutrient culture at a specific location of said body to induce the growth of a suborgan.
124. The method of claim 123, wherein said genetic material comprises a gene.
125. The method of claim 124, further comprising controlling said gene with use of a genetic switch.
126. The method of claim 123, wherein said genetic material comprises a growth factor.

127. The method of claim 123 further comprising placing an extracellular matrix around said genetic material.
128. The method of claim 123, wherein said suborgan comprises a cell.
129. The method of claim 128, wherein said cell is an Islet cell.
130. The method of claim 123, wherein said suborgan comprises a group of cells.
131. The method of claim 130, wherein said group of cells are Islet cells.
132. The method of claim 123, wherein said suborgan comprises a neuron.
133. The method of claim 123, wherein said suborgan comprises dermis.
134. A method of growing an organ comprising inserting genetic material into a cell outside a body to induce and promote morphogenesis and growth of an organ.
135. The method of claim 134, wherein said genetic material comprises a gene.
136. The method of claim 135, further comprising controlling said gene with use of a genetic switch.

137. The method of claim 134, wherein said genetic material comprises a growth factor.
138. The method of claim 134, further comprising placing an extracellular matrix around said genetic material.
139. The method of claim 134, wherein said cell comprises a group of cells.
- 112 140. The method of claim 139 further comprising utilizing a physiological nutrient culture to promote said morphogenesis and growth of an organ.
141. A method of growing a suborgan comprising inserting genetic material into a cell outside a body to grow a suborgan.
142. The method of claim 141, wherein said genetic material comprises a gene.
143. The method of claim 142, further comprising controlling said gene with use of a genetic switch.
144. The method of claim 141, wherein said genetic material comprises a growth factor.
145. The method of claim 141, further comprising placing an extracellular matrix around said genetic material.
146. The method of claim 141, wherein said cell comprises a group of cells.

147. The method of claim 141 further comprising utilizing a physiological nutrient culture to promote growth of said suborgan.

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148. A method of growing a tooth in a mouth of patient comprising creating an implant opening and then inserting an upstream initiator gene into said mouth at said opening to cause said tooth to grow.

149. The method of claim 148, further comprising controlling said initiator gene with use of a genetic switch.

150. The method of claim 148 further comprising adding a growth factor at said opening.

151. The method of claim 148, wherein said initiator gene comprises Bmp2,4.

152. The method of claim 148, wherein said initiator gene comprises EGF.

153. The method of claim 148, wherein said initiator gene comprises FGF8.

154. The method of claim 148, wherein said initiator gene comprises Lef1.

155. The method of claim 148, wherein said initiator gene comprises Msx1.

156. The method of claim 148, wherein said initiator gene comprises Msx2.

157. The method of claim 148, wherein said initiator gene comprises Shh.
158. The method of claim 149, wherein said initiator gene comprises MSX1 and said growth factor comprises BMP2, BMP4, and BMP7.
- AZ 159. The method of claim 148, wherein said upstream initiator gene is contained in a gel carrier.
160. The method of claim 149, wherein said growth factor is contained in a gel carrier.
161. A method of growing a tooth in the mouth of a patient comprising creating an implant opening and then inserting a growth factor into said mouth at said opening to cause said tooth to grow.
162. The method of claim 161, wherein said growth factor comprises a gene.
163. The method of claim 162, further comprising controlling said gene with use of a genetic switch.
164. The method of claim 161, wherein said growth factor is contained in a carrier.
165. A method of forming an organ comprising providing a cell and inserting a gene into said cell to cause said cell to grow into an organ.

166. The method of claim 165, further comprising controlling said gene with use of a genetic switch.
167. The method of claim 165 further comprising obtaining said cell from a patient and placing said organ into the body of said patient.
168. The method of claim 166, wherein said cell is a skin cell.
169. The method of claim 166 further comprising repairing said cell prior to inserting said gene.
170. The method of claim 165 further comprising adding a growth factor prior to inserting said gene.
171. The method of claim 165 further comprising adding a growth factor while inserting said gene.
172. The method of claim 165 further comprising adding a growth factor following inserting said gene.
173. The method of claim 170, wherein said growth factor comprises extracellular matrix.
174. The method of claim 171, wherein said growth factor comprises extracellular matrix.

175. The method of claim 172, wherein said growth factor comprises extracellular matrix.
176. A method of forming an organ comprising providing a cell and adding a growth factor to said cell to cause said cell to grow into an organ.
177. The method of claim 176, wherein said growth factor comprises a gene.
178. The method of claim 177, further comprising controlling said gene with use of a genetic switch.
179. The method of claim 176 further comprising obtaining said cell from a patient and placing said organ into the body of said patient.
180. The method of claim 176, wherein said cell is a skin cell.
181. The method of claim 176 further comprising repairing said cell prior to inserting said gene.
182. The method of claim 176, wherein said growth factor comprises extracellular matrix.
183. A method of treating autoimmune diseases comprising inserting a growth factor in a body of a patient to control cell migration.

184. The method of claim 183, wherein said growth factor comprises extracellular matrix.
185. The method of claim 183, wherein said growth factor comprises a gene.
186. The method of claim 185, further comprising controlling said gene with use of a genetic switch.
- A2 187. The method of claim 186, wherein said genetic switch controls cell function.
188. The method of claim 186, wherein said genetic switch controls cell growth.
189. A method of treating an inflammatory disease comprising inserting a growth factor in a body of a patient to control cell migration whereby inflammatory cell migration into an inflamed area is prevented.
190. The method of claim 189, wherein said inflammatory disease is arthritis.
191. The method of claim 189, wherein said growth factor comprises extracellular matrix.
192. The method of claim 189, wherein said growth factor comprises a gene.
193. The method of claim 190, wherein said growth factor comprises extracellular matrix.
194. The method of claim 190, wherein said growth factor comprises a gene.

195. A method of restoring the function of an organ that does not operate to a desired capacity comprising inserting a growth factor in an area of the body of a patient to mimic extracellular fluid and improve the capacity thereby of said organ.

196. The method of claim 195, wherein said growth factor comprises a cell.

197. The method of claim 196, wherein said cell comprises a stem cell.

198. The method of claim 195, wherein said growth factor comprises extracellular matrix.

199. The method of claim 195, wherein said growth factor comprises a gene.

200. The method of claim 195, wherein said growth factor is inserted into said organ.

201. The method of claim 195, wherein said growth factor is inserted around said organ.

202. The method of claim 195, wherein said growth factor comprises a gene.

203. The method of claim 202, further comprising controlling said gene with use of a genetic switch.

204. A method of growing a new portion of a pre-existing organ comprising placing a growth factor in a body of a patient to grow new muscle in said organ.

205. The method of claim 204, wherein said organ comprises a heart.

206. The method of claim 205, wherein said growth factor comprises a cell.

207. The method of claim 205, wherein said growth factor comprises a gene.

A2 208. The method of claim 205, wherein said growth factor comprises a cell and a gene.

209. The method of claim 204, further comprising reviving a dead portion of said organ by placing a growth factor in said body to grow new arteries at said dead portion of said organ.

210. The method of claim 205, further comprising reviving a dead portion of said organ by placing a growth factor in said body to grow new arteries at said dead portion of said organ.

211. The method of claim 206, further comprising reviving a dead portion of said organ by placing a growth factor in said body to grow new arteries at said dead portion of said organ.

212. A method of replacing a pre-existing organ in a body of a patient comprising placing a growth factor at a desired site of said body to cause said body to grow a new organ and then removing said pre-existing organ thereby permitting said new organ to replace said

pre-existing organ.

213. The method of claim 212, further comprising placing said new organ at the former site of said pre-existing organ.

A2 214. The method of claim 212, wherein said organs comprise hard tissue.

215. The method of claim 214, wherein said organs comprise a tooth.

216. The method of claim 212, wherein said organs comprise soft tissue.

217. The method of claim 216, wherein said organs comprise a heart.

218. A method of replacing a pre-existing organ in the body of a patient comprising placing a growth factor at a desired site of said body to form a new organ to replace said pre-existing organ.

219. The method of claim 218, wherein said new organ is placed at a site of said the body formerly occupied by said pre-existing organ.

220. The method of claim 218, wherein said new organ comprises hard tissue.

221. The method of claim 218, wherein said new organ comprises a tooth.

222. The method of claim 218, wherein said new organ comprises soft tissue.
223. The method of claim 222, wherein said new organ comprises a heart.
224. The method of claim 218, wherein said new organ is grown at a first site in said body of said patient that is different from the site of said pre-existing organ and then said new organ is removed from said first site and moved to said site of said pre-existing organ.

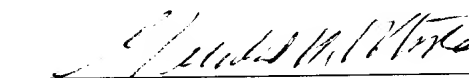
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225. The method of claim 224, wherein said new organ comprises hard tissue.

226. The method of claim 225, wherein said organ comprises a tooth.

This Preliminary Amendment is submitted in an effort to advance the prosecution of the instant application. An early examination of the application is respectfully requested.

Respectfully submitted,

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